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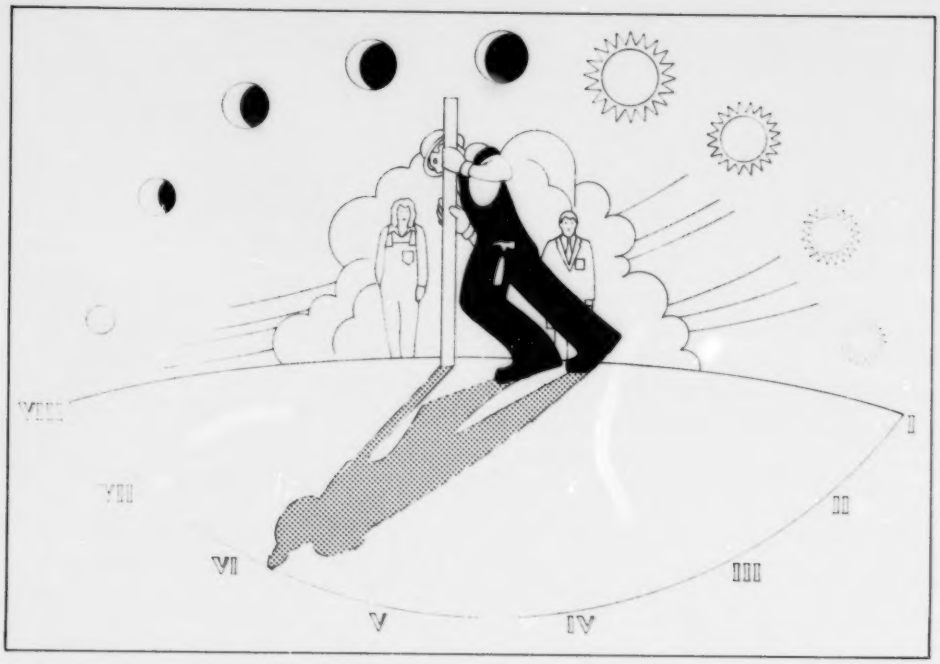

Proceedings of a Symposium on Hours of Work and Overtime: Labour Market Issues

PROCEEDINGS OF A SYMPOSIUM ON HOURS OF WORK AND OVERTIME; LABOUR MARKET ISSUES, JUNE 1986

by

Ronald Ehrenberg, Daniel Hamermesh,
and Robert Hart

(Background Report for the
Ontario Task Force on Hours of
Work and Overtime)

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Abstract: Proceedings of a Symposium on Hours of Work and Overtime: Labour Market Issues

These proceedings bring together papers by three internationally known academics who have conducted research on the theoretical and econometric issues pertaining to restrictions on hours of work and overtime. The papers, which were presented at a symposium on June 26, 1986, and commented on by other experts on the topic, are: "On Overtime Hours Legislation," by Ronald Ehrenberg; "Overtime Hours and the Demand for Labour, Workers and Hours," by Daniel Hamermesh; and "Hours of Work and Overtime: Lessons from the European Experiences," by Robert Hart. The papers point out the limitations of policies designed to reduce hours of work and overtime, as well as the limited job creation potential of reductions in hours of work and overtime.

ON OVERTIME HOURS LEGISLATION

by

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(A Report Prepared for the Ontario Task Force on Hours of Work and Overtime)

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The views expressed in this report are those of the author and need not reflect the position of the Ontario Task Force on Hours of Work and Overtime, Cornell University, or the National Bureau of Economic Research.

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ON OVERTIME HOURS LEGISLATION

INTRODUCTION

In the United States, proposals have been periodically introduced into Congress to amend the provisions of the Fair Labour Standards Act (FLSA) to restrict the use of overtime hours and stimulate employment growth. This report summarizes the research I have conducted since 1970 on the likely effects of these proposed policy changes and my appraisal of their desirability.[1] Although all of the empirical results I discuss pertain to United States data, they suggest the type of empirical analyses that should be undertaken with Canadian data before decisions about policy changes are made here.

I begin in the first main section with a brief history of hours of work legislation in the United States that includes a conceptual framework that I have found useful in analyzing proposed changes in hours legislation. The variety of empirical analyses I have undertaken that pertain to the wisdom of raising the overtime premium are discussed in the second section. My analyses of proposals to require employee consent prior to the working of overtime are discussed in the third section. The paper ends with some brief concluding remarks.

HOURS OF WORK LEGISLATION IN THE UNITED STATES

The overtime pay premium provisions of the Fair Labour Standards Act (FLSA) currently regulate only two dimensions of the hours of work relationship -- the number of hours after which the overtime premium goes into effect (forty) and the premium level (time and a half). Several European countries and Ontario regulate other dimensions in their legislation: for example, they require either prior governmental approval for overtime or employees to give their consent to working overtime, or both. A bill to amend the FLSA introduced into Congress in 1979 by Representative

Conyers would similarly have prohibited the mandatory assignment of overtime in the United States, as well as raised the overtime premium from time and a half to double time and required premium pay after 35 rather than 40 hours. To introduce the analytic framework that I believe is useful in thinking about such a proposal, or similar ones for Canada, I begin with a brief summary of the history of hours of work legislation in the United States.

The earliest forms of hours of work legislation in the United States were initiated at the state level, applied to women and children, and had the aim of reducing fatigue and exhaustion (Commons and Andrews 1920; Paulsen 1959; Phelps 1939). For example, in 1879 legislation regulating maximum hours of work was introduced in Massachusetts, where its supporters claimed that long workweeks were exhausting and caused women to age prematurely (Cahill 1932, pp. 106-107). The first hours laws covering men in the private sector were also at the state level and covered occupations in which long workweeks adversely affected third parties or employees themselves. For example, legislation in 1890 in Ohio limited the hours of train operators in the hope that this would reduce railroad accidents and protect the travelling public. This law was quickly followed by state laws limiting the workweek of miners, who were subject to unhealthy and unsafe working conditions (Paulsen 1959, p. 114).

In each of these cases a rationale (from the perspective of an analytical labour economist) for the protective labour legislation is found in the fact that the marginal social cost of longer workweeks exceeded the marginal private cost to employers. In the absence of government intervention these divergences persisted for a variety of reasons: low family income levels did not permit many women and children the luxury of turning down jobs with long hours; no good alternatives to the railroads existed for long-range travel and railroad passengers were not always accurately informed about railroad employees workweeks; and the limited

alternative employment opportunities in mining communities often restricted the occupational choice of individuals in those areas. In each case, then, markets failed, in the sense that compensating wage, or price, differentials did not arise to compensate employees, or third parties, for the full risks they incurred because of long hours of work. The case for government intervention was strong; the only real question is why the legislation took the form or outright restrictions on hours rather than the use of tax or penalty schemes to increase employers' marginal private cost of longer hours.

At the federal level, throughout the early 1930s, bills were repeatedly introduced into Congress to limit the length of the workweek. While the goal of protecting existing employees from the ills associated with excessive fatigue remained, a second explicit purpose of such legislation was to increase employment by spreading the available work. Ultimately on June 25, 1938, the Fair Labour Standards Act, with its overtime provisions, was enacted.

Once again, the provisions of the Act can be rationalized in terms of the divergence between private and social costs. Even if employers and their employees in the 1930s were satisfied with long workweeks, their private calculations ignored the social costs borne by the unemployed. The time and a half rate for overtime can be thought of as a tax to make employers bear the full marginal social cost of their hours decisions; it was meant to reduce the use of overtime hours and to stimulate employment, at least to the extent that the increased costs do not substantially reduce total person-hours demanded. Furthermore, if employees were not satisfied with long workweeks during the 1930s but, because of market imperfections, they did not have the freedom to choose employment with employers who offered shorter workweeks, the direct payment of the tax to employees who worked longer

workweeks can be justified as an attempt to remedy this imperfection.

ON THE WISDOM OF RAISING THE OVERTIME PREMIUM

Although coverage under the overtime pay provisions of the FLSA has increased substantially over the last half century, the premium itself has remained constant at time and a half. Periodically, as in the Conyers bill, proposals have been introduced in Congress to raise the premium to double time. The underlying argument made to support the increase is that while unemployment remains a pressing national problem, the use of overtime hours has increased. Moreover, since the enactment of the FLSA, the deterrent effect of the overtime premium on the use of overtime has been weakened by the growing share of hiring and training costs, fringe benefits, and government-mandated insurance premiums in total compensation. Many of these costs are quasi-fixed or employee-related (e.g., vacation pay, holiday pay, sick leave, hiring costs), rather than hours related, in the sense that they do not vary with overtime hours. An increase in these quasi-fixed costs reduces employers' marginal costs of working their employees overtime, relative to their costs of hiring additional employees. The growth of these costs, it is claimed, has been at least partially responsible for the increase in overtime and therefore an increase in the overtime premium paid by employers is required to offset this adverse effect.

A complete analysis of the desirability of raising the overtime premium requires answers to a number of empirical questions. Would higher overtime pay rates relative to the quasi-fixed costs of employment induce employers to reduce their usage of overtime hours? Would reductions in overtime hours be "converted" to full-time jobs or "lost" to capital substitution or output reductions? Would employers comply with the legislation? Would workers who previously worked overtime, moonlight at second jobs and reduce the employment

opportunities for unemployed individuals? Would the unemployed have the skills necessary to fill any new jobs that might be created? Finally, what would be the income distribution consequences of the proposed policy change? Empirical analyses directed at answering all of these questions, and others, are summarized below.

My own research and that of others has demonstrated that, across establishments in the United States, a strong positive relationship exists between the use of overtime hours and the ratio of weekly nonwage labour costs per employee to the overtime wage rate (Ehrenberg and Schumann 1982a, Ch. 2). This implies that increasing the overtime premium to double time would substantially reduce the average use of overtime hours, perhaps by as much as 20 per cent, on average, if compliance with the legislation did not change and if straight-time wage rates were not affected. Moreover, to the extent that the reduction in hours could be converted into new full-time employment, such a change in the legislation has the potential to increase the employment of workers subject to the overtime provisions by perhaps 1 or 2 per cent. It must be stressed that in the United States less than 60 per cent of the workforce is subject to the overtime pay provisions, due to many industry, occupation, and size class exemptions that exist. So the potential to increase the overall employment level is somewhat less.

Whether such increases in employment would actually occur and whether the new jobs would go to currently nonemployed individuals is another matter. These estimates are predicated on a number of assumptions; if any fail to hold the actual employment gains would be reduced.

First, the maximum employment gain estimates assume that the demand for labour is completely inelastic so that a wage increase does not lead to any reduction in employment. Thus any reduction in overtime hours would be converted into new jobs. An increase in the overtime premium, however, does

raise the average cost per person-hour of labour; this should bring about a shift toward more capital-intensive means of production and, to the extent that the cost increase is passed on to consumers in the form of higher prices, to a reduction in output. Both effects should lead to a decline in the number of person-hours demanded by employers. Simulations we did based on previous estimates of the wage elasticity of demand for labour (see Hamermesh 1986) suggest that this factor should cause the estimate of the number of new jobs created to fall by 0.25 percentage points (Ehrenberg and Schumann 1982a, Ch. 3).

Second, the estimated employment effects assume that all the new jobs created would go to individuals who were unemployed. This ignores the possibility of increased moonlighting by currently employed workers whose overtime is restricted. If this occurred, the actual employment gains would be reduced. Our simulations based on previous studies of moonlighting decisions (Shishko and Rostker 1976) suggest, however, that increased moonlighting would not significantly restrict the number of newly created jobs that would go to the unemployed (Ehrenberg and Schumann (1982a, Ch. 3).

Third, the employment gain estimates assume that indivisibilities in production processes will not prevent any reduction in overtime hours from being converted to new full-time jobs. For example, while large establishments may have the option of substituting one new full-time employee for the overtime hours of twenty employees who each work two overtime hours a week, small establishments with only a few employees working overtime may not enjoy such options. If such constraints existed, one might contemplate exempting small establishments from any increase in the overtime premium; this would reduce the estimated employment gain associated with an increase in the premium. The only study using U.S. data that looked at the issue, however, found no systematic relationship between establishment size and the existence of

a trade-off between overtime hours and employment (Ehrenberg 1971a).

Fourth, these estimates assume that an increase in the overtime premium will not lead to compensating adjustments in straight-time wages or fringe benefits. Suppose, however, that firms and their employees were initially in an equilibrium situation in which overtime hours were regularly scheduled. One plausible response to a legislated increase in the premium is for them to voluntarily agree to a reduction in the level of straight-time wages, or fringes, or both, leaving total compensation for the initial number of hours unchanged. If this occurred, it may be argued that neither side would have an incentive to reduce the usage of overtime (the legislation would have had no effect on the employer's total costs or on the employee's total compensation for the given number of hours) and the resulting employment gain would be reduced. While I have not obtained any evidence on the probability that such compensating wage or fringe benefit differentials would arise, at least one previous study has found that increases in the minimum wage sometimes lead to compensating reductions in fringe benefits (Wessels 1980). Thus, this possibility should not be dismissed out of hand.

Fifth, these estimates assume either that the skill distributions of those working overtime and those who are unemployed are sufficiently similar that bottlenecks will not arise, or that the elasticity of substitution between the unemployed and those working overtime is very high. Put another way, they assume either that there will always be unemployed workers available to fill the newly created positions or that the occupations that the unemployed are in easily can be substituted for the occupations of those working overtime.

In fact, analyses we have conducted of the distribution of the experienced unemployed by skill class and geographic

area, and the similar distribution for those working overtime, using data from the May 1978 Current Population Survey (CPS), suggest that bottlenecks may well arise (Ehrenberg and Schumann 1982a, Ch. 4). Indeed, the data suggest that at least 8.5 per cent of all the newly created jobs would go unfilled for want of workers with the required skills residing in the same geographic area. This estimate is subject to a number of qualifications, however, and the importance of the skill bottleneck problem will depend on which stage of the business cycle the economy is in. In periods of higher unemployment, when less overtime is worked, skill mismatches would be less of a problem.

Moreover, our previous analyses ignored the question of the substitutability of overtime hours, in occupations in which overtime is worked, for new employment, in occupations in which the experienced unemployed "reside". Hamermesh (1986) provides estimates of substitution across skill categories of labour that should prove useful in this regard and his report in this volume addresses this issue in more detail.

Finally, the maximum employment gain estimates assume both that the overtime pay provisions of the FLSA are fully complied with, and that an increase in the overtime premium would not reduce the compliance rate. In fact, analyses of the May 1978 CPS data and the 1977 Michigan Quality of Employment Survey (QES) data suggest that at least 10 to 20 per cent of the employees working overtime who should legally receive a premium of time and a half for overtime fail to receive it. If the noncompliance rate were to remain constant in response to an increase in the premium to double time and employers continued to pay these employees the same premium, employers usage of overtime hours would not change, and the estimated employment gain estimates would be reduced by 10 to 20 per cent (Ehrenberg and Schumann 1982a, Ch. 5; 1982b).

Taken together, these factors suggest that the employment gain associated with an increase in the overtime premium is likely to be considerably less than the maximum estimates reported above. Furthermore, analysis of the income distributional consequences of the legislation that we conducted suggests that middle-income and upper-income families would gain more from an increase in the overtime premium than would lower income families (Ehrenberg and Schumann (1982a, Ch. 6). More specifically, an analysis of the May 1978 CPS data suggested that overtime earnings per family increase with family income, and that the net effect of an increase in the overtime premium (taking account of the increased premium rate, the decreased overtime hours, and the increased employment) would be to increase average family income more for middle-income and upper-income families than it would for lower-income families. When the inflationary consequences of the legislation are added in, the case for increasing the overtime premium to double time is substantially weakened.[2]

On the basis of the evidence I have summarized above, Schumann and I concluded that raising the overtime premium would not be an effective way of stimulating growth, even though it would lead to a reduction in overtime hours. Moreover, it would not have desirable income distribution consequences (Ehrenberg and Schumann 1982a).

Raising the overtime premium <u>paid</u> by employers might make sense for another reason, however, if the revenue that would accrue from such an increase was <u>not</u> distributed to employees in the form of higher premium pay <u>received</u> by them for overtime. Instead, the revenue from any increase in the tax on overtime would go directly to aid the unemployed; for example it could be contributed to unemployment insurance funds or to employment and training program budgets. Unless it can be demonstrated that market imperfections prevent currently employed workers from freely choosing the length of their workweeks and that the existing overtime premium does

not fully compensate these workers for the disutility associated with long workweeks, then no increase in the premium paid to employees is justified. One can thus logically be in favor of raising the tax paid by employers when they use overtime hours but not in favor of raising the overtime premium paid to employees. In fact, a proponent of such a proposal in the United States historically has been the United Automobile Workers.[3]

ON THE WISDOM OF REQUIRING EMPLOYEE CONSENT FOR OVERTIME HOURS

What about the Conyers proposal to legislate the prohibition of mandatory overtime, as is done in several European countries? Presumably such a proposal can be viewed as being based upon the belief that market imperfections persist in the labour market and that the overtime premium does not fully compensate employees for the disutility associated with mandatory overtime. One may question, however, whether markets have failed here. There appear to be a variety of overtime hours provisions offered in the U.S. labour market. For example, only 16 per cent of the respondents in the 1977 Michigan Quality of Employment Survey (QES) who reported working overtime also reported that the overtime hours decision was made unilaterally by their employer and that overtime was mandatory in the sense that employees who refused it suffered a penalty (Quinn and Staines 1979, pp. 90-91). In addition, roughly 20 per cent of employees covered by major collective bargaining agreements in 1976 had explicit provisions in their contracts that gave them the right to refuse overtime (U.S. Bureau of Labour Statistics 1979).

To the extent that labour markets are competitive and establishments do offer a variety of overtime hours provisions (e.g., employer determines, employee determines, penalty for refusal), compensating wage differentials should arise. That is, to attract labour, establishments that

offered distasteful mandatory overtime provisions would have to pay higher straight-time wages, higher overtime premiums, or higher fringe benefits than establishments in which such provisions did not occur. If fully compensating wage differentials exist, there is no case for legislative prohibitions against mandatory overtime. Evidence on the extent is of importance to policy makers.

In fact, our empirical study of the subject for the United States, using the QES data, found that, on average, such compensating differentials did not exist (Ehrenberg and Schumann 1982[a], 1984). This finding provides some support in favor of a prohibition of mandatory overtime, although the benefits from such legislation would have to be weighed against the potential costs; the latter include reduced employer flexibility in scheduling production, and thus, increased production costs, which would lead in turn to lower employment levels. The study also found, however, that compensating differentials did exist for union members. That is, unions were able to win for their members through the collective bargaining process what the market on average did not produce.[4] The workers most "in need" of the prohibition on mandatory overtime in the United States appear then to be nonunion workers.

CONCLUDING REMARKS

The discussion above summarizes what I believe prior empirical research in the United States has told us about the wisdom of either raising the overtime premium or prohibiting assignment of overtime without employee consent in the United States. While empirical estimates for one country may be useful as a starting point for discussing policy in another country, given differing institutional arrangements or behavioral relationships between countries, they should be used only as a starting point. In a sense, this report may best be viewed as indicating the types of research that should be undertaken using Canadian data.

One proposal that I have not addressed directly is to reduce the standard workweek; Robert Hart discusses European analysis of this issue in his report in this volume. Variations in standard workweeks in U.S. data are very small so no prior analysis of them has been undertaken. However, one can conceptualize such a proposal in a very similar manner to that of raising the overtime premium.

For example, a requirement in, say, the U.S. that employers pay time and a half after the first thirty-five hours per week, would increase the average hourly wage cost of the first forty hours per employee by 6.25 per cent. If the requirement were for double time, the average hourly wage for the first forty hours would increase by 12.5 per cent. In either case, employers would reduce the total person-hours they demand, and this would limit the positive employment effects of the legislated change.

Similarly, converting the hours between thirty-six and forty into overtime hours would increase employers' incentives not to comply with the legislation and lead to possible compensating decreases in straight-time wages and fringes. Both these changes would reduce employers' incentives to substitute increased employment for overtime hours. Finally, one would again have to consider the possibility that skill mismatches between the unemployed and the new jobs that were created would constrain the employment effects of the change in the legislation. Of course, since this amendment would apply to all covered full-time workers, not solely those working more than forty hours, it is less likely that skill mismatches would be a problem in this case. Put another way, the skill mix of all covered full-time workers than it is to the skill mix of those working overtime.

Notes

1. My research has been reported in Ehrenberg 1971a, 1971b, 1971c and Ehrenberg and Schumann 1981, 1982a, 1982b, 1984. This report draws heavily from that material.

2. In Ehrenberg and Schumann (1982a, Ch. 3), we calculated that an increase in the overtime premium to double time might increase average hourly costs by 0.8 per cent for workers covered by the legislation.

3. A similar proposal was offered in U.S. Department of Labour (1967) by Howard Young who favoured both raising the overtime premium to double time and instituting an additional surtax on overtime that would be paid by the employer directly into a social welfare fund. Young was a special consultant to the president of the UAW at the time. More recently, this position was supported by Kenneth Meyers, a regional director of the UAW in his testimony on the Conyers bill (see U.S. House of Representatives 1980).

   If one is concerned that such a proposal will increase employers' costs, one can offer them marginal employment tax credits equal to the amount of their increased costs for expanding employment. This would provide a further incentive to them to increase employment.

4. The finding that unionized workers receive compensating wage differentials for unfavorable job characteristics, while nonunion workers often do not, is not unique to the mandatory overtime issue.

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OVERTIME HOURS LAWS AND THE DEMAND FOR, WORKERS AND HOURS

by

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The points of view expressed herein are solely those of the author and do not necessarily represent those of either of the organizations with which he is affiliated or the Ontario Task Force on Hours of Work and Overtime.

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OVERTIME HOURS LAWS AND THE DEMAND FOR WORKERS AND HOURS

POLICY PROPOSALS AND THE LONG-RUN STRUCTURE OF LABOUR COSTS

For purposes of economic analysis, at least three distinct policy options are available for reducing hours of work. The first represents an increase in the rate of premium pay for overtime hours after the standard workweek at which overtime wages become payable; the second represents a reduction in the standard workweek or workday at which overtime pay becomes payable; and the third represents a cap or a ban on the total amount of overtime a firm is allowed to offer workers.

The policy questions of interest can be divided into impacts on total hours worked and impacts on total employment, where we make the distinction that total hours equals the number of employees multiplied by the number of hours per employee. Within these aggregate impacts it is also interesting to examine how total hours and employment are affected differently among various demographic groups. The importance of this is in direct proportion to the disparities among demographic groups in the amount of overtime worked, the differences among groups in own-price

demand elasticities, and the degree of substitutability among workers in different demographic groups.

To examine the long-run impacts of the three types of policy proposals as parsimoniously as possible, imagine a firm that employs two types of labour. We assume that the firm must pay a premium wage rate at a percentage P on all hours in excess of some limit H*. Under these assumptions labour costs are:

$$(1) \qquad \sum_{i=1}^{2} [Hi.Wi+Vi].Ei \quad + \quad \sum_{i=1}^{2} \max([Hi-H^*]\ [1+P]Wi.Ei,0),$$

where V^i is the fixed, per-worker cost of employing a worker of type i; H denotes hours; W is the wage rate; and E is employment. This specification of labour costs captures the notions of wage premia and limits on hours and is an extension of Rosen's (1978) model. With this specification, the cost of an additional worker of type i is:

$$H^i \cdot W^i + V^i + \max\ ([H^i - H^*]\ [1 + P]\ Wi,\ 0).$$

The cost of an additional hour is:

$$W^i \cdot E^i, \qquad Hi < H^*;$$

$$[1 + P]\ W^i \cdot E^i, \quad H^i \geq H^*.$$

We assume that technology can be described generally as:

$$(2) \qquad Q = F(K,\ G\ [E_1,\ H_1,\ E_2,\ H_2]).$$

The production function assumes that output, Q, is produced by capital, K, which is separable from the various labour inputs. It assumes nothing about the nature of substitution

between the two types of labour, either their employment or their hours worked.

The policy prescriptions can be analyzed in terms of their effects on costs in equation (1) and the impact of those changes on the cost-minimizing firm's choice of inputs in (2). Consider first a small rise in the overtime premium P. It increases costs only on that segment of (1) in the second summation term. In particular, the cost of an extra hour is increased by:

$$W^i \cdot E^i \cdot dP, \quad H^i \geq H^*.$$
$$0, \quad H^i < H^*.$$

Clearly, if the group of workers is not working beyond the point at which firms become liable for the overtime premium, increasing the premium has no <u>direct</u> effect on the firm's usage of that type of labour. One should note that this change also affects the price of an additional worker. The change in the cost per worker is:

$$\max \{[H^i - H^*] W^i \cdot dP, 0\}.$$

The analysis of the impact of such a change in the overtime premium is by now quite standard, and the evidence on some of its likely impacts is also fairly well documented (see below).

A reduction of dH^* in H^*, the standard workweek, also affects both the cost per worker and the cost of an

additional hour. Unlike the case of a change in the overtime premium, the analysis of the effects of such a reduction is not standard. For groups for which $H^i > H^*$ or $H^i << H^*$ (i.e., much less than H^*), this proposal has no impact on the marginal cost of another hour of work. It does, however, raise the cost of an additional worker in the first of these groups by:

(3) $$- PW^i \cdot dH^*.$$

It has no direct impact on the cost of an additional worker in the second of these groups. Among groups of workers for which $H^i = H^*$, an additional hour costs an additional

$$- PW^i \cdot E^i \cdot dH^*.$$

The increased cost of another worker is the same as in (3).

A ban on overtime work is equivalent to raising the overtime premium to infinity. (A binding limit on overtime is equivalent to imposing an infinite price on quantities above the limit.) As such, it can be viewed as an increase in the relative price of overtime hours that is sufficient to induce firms to cut their demand for overtime to zero. For those groups for which $H^i > H^*$, this means the cost of an additional worker rises, although in a lesser proportion than the cost of an additional hour. For workers in those groups with $H^i << H^*$, there is no direct effect either on the cost of an additional hour or the cost of an additional worker. Finally, among workers for whom $H^i = H^*$, the cost of an

additional hour is infinite, but there is no change in the cost of an additional worker.

EVIDENCE ON THE LONG-RUN IMPACTS

The Evidence Required

The theoretical discussion makes it clear that empirical evidence is required on several issues involving the long-run, or steady-state impacts of these proposals. First, we need to know the extent to which employers will react to a given change in the relative costs of workers and hours by substituting one for the other; i.e., we need to know the extent of substitutability of workers for hours in the aggregate. Second, we need to know the extent to which an increase in the relative price of worker-hours in one group -- which is produced by a change in hours laws that makes that group labour relatively more expensive -- affects the amount of worker-hours demanded of this and other groups of workers. Third, and finally, we need to know how a relative increase in the cost of hours of one group affects the demand for workers in that and other groups.

Substitution Between Workers and Hours in the Aggregate

There are two strands of literature that bear on the issue of substitution between workers and hours in the aggregate. The first examines employment/hours trade-offs in the context of standard labour-demand equations without actually attempting

to measure relative fixed and variable costs. While it cannot, therefore, provide direct evidence on the effect that changes in labour-cost structures have on the mix of employment and hours, it can inform us whether, at a fixed level of output, an increase in the use of hours reduces or augments the demand for workers. The second strand does try to measure cost structures and, in most cases, to examine how they affect employers' demands for overtime hours.

Recent evidence from standard labour-demand equations on this issue is quite mixed. For U.S. manufacturing, 1963-1981:11, Rossana (1983) estimates a model of the demand for hours as a function of employment levels, measures of output and orders, and real wages. This type of model is inspired, as are similar models discussed here, by Nadiri-Rosen (1969).[1] The estimates suggest that for each long-run increase in employment of 10 per cent there is a 1.5 per cent drop in hours per worker. Similar equations in Rossana (1985), estimated using monthly U.S. data for 1959-1982:6 and over six two-digit SIC industries, find the stock of employment to have no significant effect on firms' demands for hours. On the other hand, equations describing employment demand for the same industries mostly show a small but significant <u>positive</u> effect of hours per worker on the demand for workers. This is somewhat perplexing, because the equations imply an asymmetry; however, since the hours and

employment equations were not estimated jointly, this asymmetry may be a result of the estimation technique (or perhaps of a specification having little grounding in microeconomic theory). Yamamoto (1982) finds negative effects of employment levels on hours per worker, and vice-versa, using quarterly data for Japanese manufacturing from 1970-1978. However, the sample period is quite short, so that it is unclear whether these really represent long-run relationships.

One study on U.S. data using similar models, but focussing on decomposing output changes into permanent and transitory components, uses data on overtime hours to produce estimates of the size of an hours/employment trade-off (Crawford, 1979). For manufacturing 1958-1976 (monthly), it finds a small but significant positive relationship between employment levels and the demand for hours. Comparing this result to those cited above, it seems quite clear that this approach provides little evidence of a long-run trade-off between employment and normal hours, i.e., of whether hours and employment are substitutes or complements. This may be because such a trade-off truly does not exist. Evidence for the very long run suggests hours per week are determined mainly by workers' preferences, not by production technology (see Hamermesh and Rees, 1984). However, insofar as these studies do not even attempt to measure the relative costs of

hours and workers, their lack of evidence is not too critical.

Several studies of the demand for overtime hours, based on cross-section data for the United States, have attempted to divide employment costs into fixed and variable components. These studies have the virtue that their choice of data allows for much greater variability in the underlying marginal costs of employment and hours, and thus at least gives the possibility of measuring the extent of substitution of employment for hours. The three analyses summarized in Ehrenberg and Schumann (1982, p. 26), and that study itself, all suggest that higher fixed costs of employment do reduce the long-run employment/hours ratio. (Obversely, increasing the penalty on employers' use of overtime raises this ratio.) In all these studies, though, the trade-offs are quite small. Large increases in the ratio of fixed to variable labour costs produce only small decreases in the employment/hours ratio. The exact magnitude of the trade-off cannot be determined given the paucity of the evidence. However, the four studies all estimate that a one-third increase in the relative cost of an hour of overtime would produce no more than a 4 per cent decline in the ratio of overtime to other hours.

Using annual data, 1951-1981, for West Germany, Hart and Kawasaki (1985) carefully decompose payments to labour, particularly payroll taxes, into fixed and variable measures and examine their effects on employment and hours per worker. Their model treats hours, employment and the capital stock as being jointly determined by their lagged values, fixed and variable payroll taxes, output, nonwage fixed and variable labour costs, and the cost of capital. The equations in the model are not estimated jointly, but simultaneity is accounted for. The authors find, surprisingly, that a cut in the payroll-tax ceiling in a tax structure with a high ceiling relative to the average wage level increases employment and reduces hours per worker. They attribute this perverse result to their use of a model that includes both capital and labour. The authors also produce the expected finding that decreased variable payroll taxes reduce the employment/hours ratio.

The evidence seems fairly clear that an increase in the variable costs of labour will induce relatively slight substitution away from hours and toward workers, holding total person-hours constant.

At least as important as the effects of the proposed policies on the demand for hours and workers holding total hours constant, are the potential effects on total hours.

Each proposal to change the hours laws represents an increase in the cost of an hour of labour. There is abundant evidence, summarized in Hamermesh (1986a), on the elasticity of labour demand with respect to labour costs. The overwhelming bulk of studies that use modern estimation techniques finds that the net long-run constant-output labour-demand elasticity (including all adjustments among firms) characterizing broad aggregates of industries is between 0.1 and 0.5. The total elasticity, which allows for scale effects, is larger still, perhaps on the order of 0.25 to 0.75. That being the case, policies that increase the costs of overtime may raise the employment/hours ratio only slightly, but they may effect substantial reductions in the total amount of worker-hours employed.

Consider the following calculation (Hamermesh and Rees 1984, p. 134). The estimates of the degree of substitution between workers and overtime hours (Ehrenberg and Schumann 1982) suggest that increasing the overtime premium from time-and-a-half to double-time in the United States would increase employment by between 0.3 and 4 per cent. The increased premium represents a 33 per cent increase in the cost of an hour of overtime. If overtime hours represent 3 per cent of total hours, the higher premium represents an increase of about 1 per cent in wage costs. If fringes are 1/3 of wage costs, the higher premium increases total labour costs by

0.75 per cent. With the high end of the reasonable range of estimates of the long-run demand elasticity (including both scale and substitution effects) at 0.75 (see Hamermesh, 1986a), total hours will be reduced by about 0.6 per cent. Using Ehrenberg and Schumann's best estimates -- that moving to double-time would increase employment at a constant total hours worked by 1.5 per cent -- we can infer that over one-third of that employment effect will be dissipated by the reduction in total hours. Using these calculations, we may conclude that society faces a trade-off of a 2 per cent reduction in total hours -- and the output those hours produce -- for each 5 per cent increase in employment that an increase in the overtime premium would generate.

Substitution Among Worker-Hours, and Differences in the Responses Across Demographic Groups

If, as seems likely, the proposed changes raise labour costs disproportionately for some demographic groups, they will induce substitution among the various groups <u>at a constant total input of effective units of worker-hours</u>. In particular, if overtime hours and long hours generally are disproportionately worked by adult men, their labour will be substituted away from. This may occur either because employers do the substitution directly or because consumers substitute away from products that are more hours-intensive.

Most of the studies that examine the issue find that adult males are q-complements for other groups of labour--i.e., as their relative quantity supplied increases, the wages of other groups of workers increase. (See Borjas 1986, Grant and Hamermesh 1981; and Berger 1983.) One cannot necessarily infer from this finding that the labour of adult men and of other groups of workers is p-complementary. However, in most cases the q- and p- relations that have been examined turn out to be opposite (Grant 1979). If that is true in this case, we may infer that the increase in the cost of using worker-hours of adult males will increase the relative usage of worker-hours of other groups, which perforce means worker-hours of women and youths at a constant input of effective worker-hours.

Just as in the previous section, where we noted that total worker-hours would decrease, so here effective total worker-hours will also decrease because of the increase in labour costs. This will occur through the substitution of capital for labour and through scale effects induced by the increase in labour costs. The effect of the possible changes in policy on total hours of various demographic groups depends on the elasticity of demand for the group's labour and on the importance of overtime hours in total labour costs for the group. The greater the total demand elasticity, and the greater the importance of overtime hours, the more

detrimental the effect of the policy change will be on the total hours worked by the group. Estimates of factor-demand elasticities vary greatly among the dozen studies surveyed by Hamermesh (1986a). However, the demand elasticity for adult men is generally lower than that for other groups of workers. This result is a reflection of the apparently general inverse relationship between a group's average skill level and the elasticity of demand for its labour. Beyond that, the studies are simply not sufficiently precise to allow us to draw any inferences about the relative magnitudes of own-price demand elasticities by demographic group.

This one bit of fairly solid evidence suggests that the proposed changes and the own-price demand elasticities work in opposite directions. Overtime hours are a smaller fraction of total hours for less-skilled groups. On the other hand, the demand elasticity for low-skilled workers is greater than that for high-skilled workers. This means that, ignoring the labour-labour substitution discussed above, the demand for labour by group will drop in roughly the same proportion in each group. With the substitution away from adult males, we can be sure that the demand for them will decrease. If the own-price effect is sufficiently large, it is entirely possible that the demand for worker-hours of other groups -- youths and adult women -- may also decrease.

With detailed information on the distribution of hours by demographic group, one could use the admittedly sparse knowledge of demand elasticities for different demographic groups to produce estimates of the direct effects of the changes on worker-hours by demographic group. Although, I do not attempt to provide such a simulation here, one should be aware that substitution toward groups on which the proposed changes have relatively little direct impact may not be sufficient to overcome the negative effect of higher labour costs if the own-price demand elasticities for these groups are sufficiently high.

Substitution of Hours for Workers by Demographic Group

We have no direct evidence on the degree of substitution between H_i and E_j. The only solid evidence to date is on the substitutability of <u>workers</u> of one group for workers of another, and on the substitutability of <u>total hours</u> of one group for total hours of another. Studies that have examined labour-labour substitution using the translog tableau have generally used data on total hours, while those that have used the framework of the generalized Leontief tableau have used data on workers.

Disappointingly, there is also no evidence on the degree of substitution of hours for workers within demographic groups. However, the analysis of the impacts of the various

proposals on marginal costs suggests that one could expect differential impacts on various demographic groups. Thus the proposals will have relatively little impact on the ratio of hours to workers among groups that tend to contain many part-time workers -- e.g., teens and married women with young children -- unless the degree of substitutability of hours for workers within these groups is much larger than among other groups. The major impact will be felt on groups that now work most of the overtime hours. Among prime-age men, and, to a lesser extent, among women without young children, an increase in the premium will produce the effects we noted in the first section of this paper, while a reduction in the standard workweek, unaccompanied by an increase in the premium, will produce the effects that we inferred above.

This complete lack of information on the substitution elasticities between E^i and H^i, and between E^i and H^j, prevents us from analyzing the extent to which the potential for job creation by the policies differs among demographic groups. Thus, all that is currently possible is to note that one could couple the indications here that jobs will be created in the aggregate at the expense of total worker-hours, with the evidence that the worker-hours demanded of adult males will surely decrease, while those demanded of other groups may decrease, too. One could make the heroic assumption <u>faute de mieux</u> that employment/hours substitution

possibilities are identical within each demographic group and infer that the 2 for 5 trade-off noted above could apply within each group. Even that, though, is pure guesswork. At this point one simply cannot even make very informed guesses about how the proposals might change the mix of workers and hours within each particular demographic group.

DYNAMIC EFFECTS OF THE PROPOSED CHANGES

Theoretical Considerations

The discussion of changes in overtime legislation has concerned problems of long-run effects -- the issues of substitution of workers of type i for hours of type i or j, and of scale effects on the total amount of labour demanded and substitution effects involving labour and other factors of production. The discussion here as well as that in the entire policy literature has ignored the impacts of these changes on the process of adjustment in the labour market. Thus there has been no consideration, for example, of how the cyclical responsiveness of the demand for overtime would be affected or of how the proposals might change employers' willingness to lay off or hire workers as product demand varies. The literature has dealt only with effects on levels of employment and hours, not with effects on variations therein.

There is a huge body of literature showing the impact of adjustment costs on the speed at which employers change factor demand in response to changes in factor prices or product demand. The general view is that, because the marginal cost of adjustment increases with the size of the adjustment made per period, firms spread adjustment over several periods. An alternative view, one which is equally consistent with the data, is that adjustment is slow where total costs of adjustment are higher, because employers are uncertain about the permanence of exogenous changes and do not wish to incur the costs of adjustment until they are fairly certain the changes are permanent. In both views, the nature of labour-market dynamics is determined by the size of adjustment costs.

Increased overtime premia, reduced standard hours, and especially bans on overtime raise the cost of increasing hours per worker during an expansion. As such, they should slow the rate of adjustment of demand for hours over the cycle. Thus we should expect the proposed changes to reduce procyclical fluctuations of hours generally, and of overtime hours particularly. In the United States, during postwar recessions, overtime hours have varied by one-third from trough to peak. That variation would be reduced by the proposals being analyzed here.

Since the adjustment of employment demand is closely related to adjustment of the demand for hours, we would expect the increases in the cost of adjusting hours to produce greater fluctuations in the demand for workers over the cycle. Employers, for whom the costs of adjusting hours per worker have been raised, will meet shocks to their demand for labour by adjusting the number of workers more readily. This means that the proposed changes, while they may generate more employment on average over the cycle (along with fewer worker-hours on average), will also generate greater fluctuations in employment, and probably greater fluctuations in unemployment as well.

The Evidence

There is a substantial amount of evidence, summarized in Hamermesh (1986a), that allows us to infer that these effects will occur. There is no doubt that changes in the demand for employment and hours lag behind changes in output, with the lags being greater for employment than for hours per worker. Whether the empirical results are due to adjustment costs has not been demonstrated: however, Morrison and Berndt (1981) use annual U.S. data for 1952-1971 to show that the adjustment of nonproduction-worker employment to changes in output demand is much slower than that of production-worker employment. Nissim (1984)[2] reports similar findings for the British engineering sector for 1963-1978. Similarly, de

Pelsmacker (1984) finds the same qualitative results for Belgian auto plants from 1976 through 1982. Perhaps an even stronger indication that the lags stem from underlying differences in adjustment costs is the evidence of Mairesse and Dormont (1985), who use annual microeconomic data covering 1970-1979 and the same model in each country to demonstrate that the lags in employment adjustment are greater in France and the Federal Republic of Germany than in the United States. Since it is generally believed that there are fewer legislated and bargained adjustment costs on employers in the U.S., this finding is consistent with the role of adjustment costs in affecting lags in employment adjustment.

In addition to these findings, there is some inferential evidence that increases in the relative costs of adjusting employment (hours) slow the speed of adjustment of employment (hours) relative to hours (employment). The most relevant evidence here is for the unemployment insurance program in the United States, which is financed by what is essentially a fixed tax (because of a very low tax ceiling). Hamermesh (1978) showed that expansion of the program produced some short-run substitution away from employment and toward increased hours per worker. Implicitly, the UI system increased the relative rapidity with which employment is adjusted in response to changes in product demand.

The short-run effects of policies that make it more difficult to adjust employment have also received some empirical attention. Nickell (1979) examined British manufacturing data for 1955-1976 and found that the lag in employment rose during this period, while the lag in hours declined. He attributed these changes to the increased requirements of job-security policies. More recently, Nickell (1982) showed that between 1967 and 1977 an increase in the use of unfair dismissal legislation caused a reduction in both hiring and flows from employment, with the latter dominating. Hamermesh (1986b) has shown that the speed of employment adjustment decreased in most OECD countries during the period 1973-1985 as compared to 1961-1972. Since this latter period coincided with the adoption of policies designed to increase the difficulty of shedding labour, these results are consistent with the inference that raising adjustment costs reduces the speed of adjustment.

The body of evidence is not overwhelming in its breadth; however, the evidence that is available supports the belief that increases in adjustment costs that result from changing policy do affect the rate at which adjustment takes place. The studies by Nickell (1979), Hamermesh (1978) and Hamermesh (1986b) in particular indicate that the adjustment paths of hours and workers are dynamically substitutable. Therefore,

proposals to limit adjustment of overtime are likely to increase the rate of adjustment of, and thus fluctuations in, employment.

Further Considerations and the Need for More Information

We have not presented any direct evidence on the effect of a reduction in the standard workweek unaccompanied by a higher overtime premium. However, the theoretical discussion in the first section of this paper suggests that such a reduction will have more negative effects on employment than an equally costly increase in the overtime premium. The same reduction in the standard workweek, when accompanied by an increase in the overtime premium, will be even more likely to reduce employment. This is true both because of the perverse effects that the decline in the standard workweek has on employment (demonstrated in the first section of this paper), and because the tied proposal represents a larger increase in labour costs.

All of the calculations and discussion assume that the supply of labour of each type is perfectly elastic at the going wage. The assumptions about W in (1), though, are quite restrictive. In a general equilibrium context, wage rates of each group of workers will themselves change as a result of the policy changes; and the altered wage rates will affect our inferences about changes in employment and hours

induced by the policy changes. Our knowledge of general-equilibrium impacts is sparse enough when one assumes homogeneous labour; it is null when one relaxes the assumption and assumes heterogeneous labour that has both employment and hours dimensions.

There are two clear-cut areas containing gaping lacunae in the knowledge required to analyze the proposed changes. First, it is vital that work be done on the extent of substitution possible between workers and hours in the context of heterogeneous labour. There simply are no studies on this issue. Second, and probably more important, every study of employment/hours substitution among homogeneous workers has been conducted in a partial-equilibrium framework. With a rapidly burgeoning literature analyzing large-scale computable general-equilibrium models, it should be possible to provide estimates of the likely impact of policy changes regarding overtime without making the restrictive assumptions implicit in partial-equilibrium analysis.

Conclusions

The evidence on labour demand suggests the following conclusions, in decreasing order of certainty, about the effects of policies that raise the cost of hours:

- They will induce a decrease in the total amount of worker-hours used. This will reduce total output--real GNP -- because the economy is using fewer productive inputs.

- The decrease in worker-hours will be especially concentrated among adult men, since they are the ones working most overtime. Worker-hours among other groups may decrease also.

- The average level of employment will probably increase as employers substitute workers for hours because of the policy changes.

- Fluctuations in hours per week over the business cycle will be reduced. Fluctuations in employment will increase, leading to a less stable workforce.

NOTES

1. This equation has little basis in economic theory, both because it ignores fixed employment costs (or assumes implicitly that they are constant over time, which is clearly incorrect) and because it includes as independent variables both employment and output.

2. However, Nissim also has the strange result that the lag of skilled-worker employment behind changes in skilled workers' wages is shorter than the adjustment lag of unskilled employment behind changes in unskilled wages. This result is inconsistent with the same study's findings on lags behind output. For this reason his results cannot be taken as seriously as some of the others discussed here.

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HOURS OF WORK AND OVERTIME: LESSONS FROM THE EUROPEAN EXPERIENCE

by

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(A Report Prepared for the Ontario Task Force on Hours of Work and Overtime)

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HOURS OF WORK AND OVERTIME; LESSONS FROM THE EUROPEAN EXPERIENCE

INTRODUCTION

By far the most important European policy issue with respect to hours of work concerns the employment effects of cuts in the "standard" or "normal" workweek. Much of the recent interest in overtime working has been related to this question. In particular, economists have attempted to ascertain, at both micro- and macro- levels of analysis, the extent to which actual or potential reductions in standard hours influence employment in firms or industries where associated changes in overtime working are possible. This short review paper reflects this research bias.

Some attention is given, however, to the topic of collective bargaining and overtime working. Not only is there a strong divergence of opinion between employers and "official" national-level union attitudes towards the practice of overtime but also there is evidence of difference within unions themselves. The coexistence of high unemployment rates and high average levels of overtime in certain sectors of the European economy may, in part, reflect a collective bargaining impasse over interpreting the role of overtime. The result has been a limited tendency to change established practices.

Considerably less European interest has been focussed on questions related to the well-known U.S. work of Ehrenberg (1971) and Ehrenberg and Schumann (1982) that has studied the impact on employment and hours of legislative increases in overtime premiums. While legislation over minimum premium rates -- and other types of overtime control -- exist in some industrial sectors within a few countries, there generally are considerable degrees of freedom available to firms over the scheduling of, and remuneration for, overtime working. Attempts by European governments to increase the price of overtime relative to new employment would, therefore, involve

decidedly more radical legislative changes than in North America.

The first main section of this paper contains some background statistical information on overtime working in the U.K. and West Germany (FRG). A brief overview of the theoretical approaches to overtime working by European economists is presented in the second section. Empirical work is reported on in the third section, which concentrates on the effects that changes in the per-period length of standard working hours have on employment and overtime. The fourth section deals with collective bargaining issues. Brief concluding remarks are made in the final section.

SOME FACTS AND FIGURES ON THE U.K. AND WEST GERMANY

There is a dearth of detailed statistical information on overtime working in Europe, and it is certainly a hazardous exercise to make international comparisons. Accordingly, attention is concentrated on two major countries -- the U.K. and West Germany -- for which reasonable data are available. The U.K. has the highest incidence of overtime in Europe, while the latter is somewhere near the middle of the range.

According to data from the New Earnings Survey, in April 1985 full-time male manual workers in the U.K. (the group accounting for the bulk of overtime) worked an average of 5.4 hours of overtime over and above the standard workweek of 39.1 hours. The figures were fairly similar for the manufacturing and nonmanufacturing sectors; however, there is considerable variations within the broad categories, ranging from 2 hours per week in the clothing and footwear industries to 12 hours in road haulage. Thus, a significant proportion of workers experience very high levels of overtime. The amount of overtime is particularly striking, given the average unemployment rate of 13 per cent in 1985.

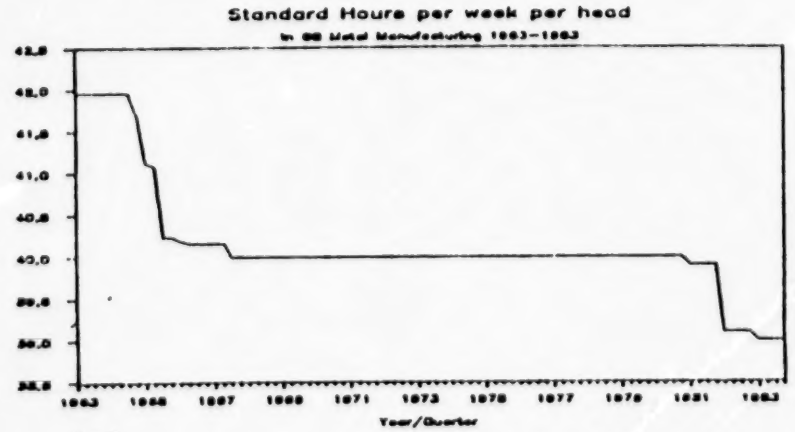
Wilson (1982) shows that in the chemicals, food, drink and tobacco, metals, engineering, textiles, clothing and other manufacturing industries, between 1954 and 1981, the average rate of decline in the hours of all workers was just under 0.5 per cent per annum for standard hours and just under 0.4 per cent for total hours, including overtime. For one industry (chemicals) the discrepancy was due to a steady rise in the proportion of workers working overtime, while in the remaining industries it is attributable to a rise in the number of overtime hours worked.

The trends in standard hours, overtime, and employment since 1963 are illustrated for the U.K. Metal Manufacturing Industry in Figure 1. The path of standard hours in quadrant (a) takes the form of a stepwise function with two major reductions in 1965 and 1968 followed by a flat plateau until the end of 1981 when, again, a further downward step applies. As would be expected, the graphs of overtime per worker and the proportion of workers working overtime in quadrants (b) and (c), respectively, exhibit strong cyclical variations with slightly rising trends. By contrast, employment in quadrant (d) shows a fairly persistent fall after 1965 relieved by occasional short-lived and relatively minor upturns. Note that the reductions in standard hours in 1965/66, illustrated in quadrant (a), are followed by overtime increases in quadrants (b) and (c), and fairly stagnant or marginally falling employment in quadrant (d). These phenomena are in line with the experience of the total U.K. manufacturing industry at this time. Of course, no hard and fast conclusions can be drawn on the basis of simple graphs, but some of the theoretical and econometric work reported on in the third section, on empirical findings, is consistent with these directions of change.

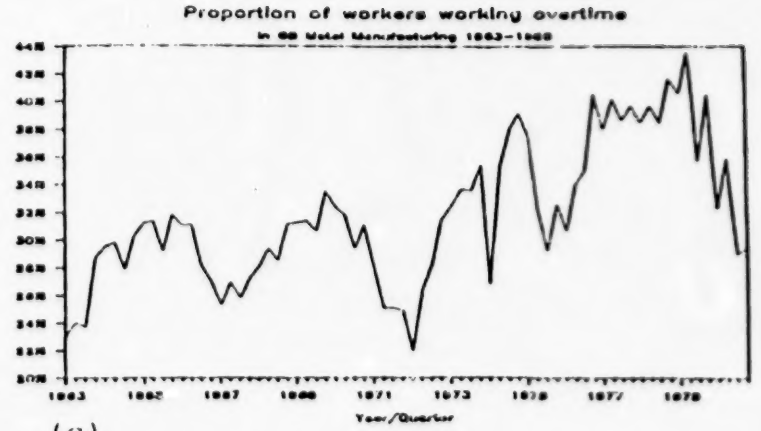
Table 1 shows the FRG trend in overtime in the context of all other work-time components for the period 1960-1980. Systematic reductions in standard and actual hours worked -- a phenomenon shared elsewhere in Europe -- contrast with a

Figure 1

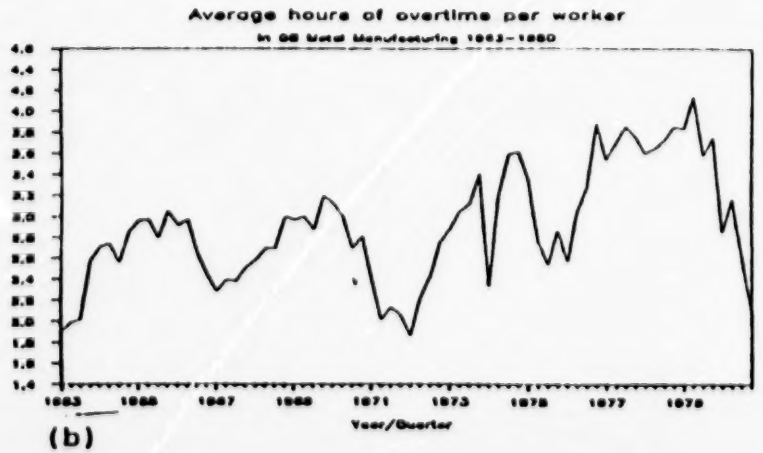
Hours of Work and Employment in the British Metal Manufacturing Industry, 1965-1980



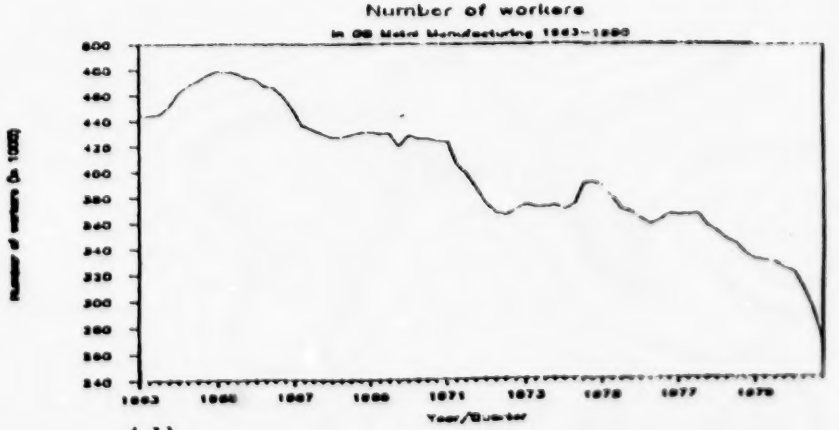
(a)



(c)



(b)



(d)

Source: Department of Employment, "Employment Gazette", London, various numbers.

TABLE 1

Components of Annual Work Time, FRG, 1960-80

Year	Negotiated Work Hours per Year: Standard hours per week	Vacation Time	Overtime Work	Short-time Work	Other Components[a]	Hours Actually Worked[b]
	(1)	(2)	(3)	(4)	(5)	(6)
1960	2249.9	125.7	94.8	0.1	137.9	2081
1965	2154.1	149.7	118.9	0.0	151.0	1976
1970	2083.4	175.8	160.5	0.2	165.2	1903
1975	2025.7	195.7	102.9	19.2	166.4	1739
1980	2015.6	219.3	95.0	3.3	178.8	1698
Per cent Change 1960-80	-10.4	74.4	0.0	32.0	29.7	-18.4

[a] Part-time work + sickness + bad weather + strikes + statutory holidays.

[b] (6) = (1)-(2)+(3)-(4)-(5); rounded

Source: Rehyer, et al. (1983), pp. 94-95.

much more cyclical pattern in overtime hours with no net change between the two end time points. Clearly, overtime work has gained as a proportion of actual hours worked. Franz (1984) reports for FRG that:

> Overtime worked each week amounted to more than one hour in 1960, two in 1965, and more than three in 1970 on average ... the reduction in hours actually worked from 48 in 1956 to 44 in 1970 was less than the reduction in negotiated hours from 47.2 to 40.7 over the same period.

OVERTIME, STANDARD HOURS AND EMPLOYMENT: LABOUR MARKET THEORY IN EUROPE

The late 1970s and early 1980s marked an upsurge in work by European economists relating to working time and employment. Hart (1986) provides a comprehensive discussion of the most significant contributions. Of course, the work has not been purely European, and several developments have stemmed from influential research by U.S. economists. It is possible to identify five main types of modelling approach.

1. Cost-minimizing/profit-maximizing labour demand models with predetermined wages. This work follows in the tradition of Rosen (1968) and Ehrenberg (1971) with recent European contributions from Hart (1984), Calmfors and Hoel (1985) and others. This model is returned to briefly below.

2. Efficiency wage models. Here, hours reductions are analyzed within a model where the firm sets the wage. The work follows in the tradition of Salop (1973 and 1979), Schlicht (1978), and Okun (1981), and the firm's quit rate plays a central role. Undoubtedly, the best attempt to extend this model into the domain of hours of work and employment is provided by Hoel and Vale (1985).

3. Union bargaining models. Recent developments in the theory of trade unions (for example, Oswald, 1982; Sampson,

1983) have provided a strong conceptual framework for studying the effect of working time reductions in a situation where a large monopoly union controls wages, leaving it to the employer to set the level of employment. While the collective bargaining arrangement in many countries limits the importance of this type of model, it is perhaps a reasonable paradigm for (sections of) a few European economies -- particularly the Scandinavian ones. Recent contributions are provided by Calmfors (1985), Hoel (1984) and Booth and Schiantarelli (1986).

4. Implicit contract models. The work of Feldstein (1976) and Baily (1977) provides a well-known efficient contract framework for studying the relationships between hours and employment. Recent extensions are provided by FitzRoy and Hart (1985) and Rosen (1985).

5. Macroeconomic models. This category is something of a "catch-all," since it covers a wide variation of European theoretical models that attempt to capture the wider macro implications of working-time changes. Good examples of such work include Dreze and Modigliani (1981), Strøm (1983), and Hoel (1986).

A number of general comments are worth making concerning these five categories. First, not all the models have been developed in order to capture the distinction between endogenous overtime hours and exogenous standard hours. Without doubt, category (i) has progressed furthest in this direction, while only a few contributions have made headway in the other categories. Second, related empirical work has its roots, almost exclusively, in categories (i) and (v). In the latter case, however, the large scale macroeconometric models are usually only loosely (if at all) associated with the underlying theory. Third, practically all this work, with varying degrees of emphasis, would concur with the concluding comments of Hoel and Vale (1985), who declare that government action to reduce the length of the workweek "is a

very uncertain policy for reducing unemployment, as the effect might very well be the opposite of what is intended."

Combining theoretical and empirical work, category (i) scores highest in Europe, at least in so far as the influence of academics on the general working-time "debate" is concerned. Since much of the empirical discussion in the next section relates to this type of model, it is worth reporting briefly on a number of theoretical predictions. For detailed analyses of both cost-minimizing and profit-maximizing approaches see Calmfors and Hoel (1985) and Hart (1986).

The work in category (i) makes distinctions between firms working overtime hours and firms working only standard hours. In general, the results hinge on modelling assumptions in two areas: the forms of the production function and the wage schedule. Cobb-Douglas formulations dominate the former while stepwise linear schedules are common in the latter. Santamaki (1983, 1984, and 1986) has made a number of important contributions on modifying both types of functions. While the substitution effects are the same as in (A) and (B) in the profit-maximizing approach, there are also negative scale effects of standard hours reductions to consider. The summary here is based on these choices. Also, a crucial feature that drives these models is that they distinguish between quasi-fixed and variable labour costs.

While there are a number of variations on the main theme -- especially if more complicated wage schedules are adopted -- the <u>dominant</u> findings from the cost-minimizing approach are:

(A) <u>for firms working overtime in equilibrium</u>, a reduction in standard hours is predicted to result, <u>ceteris paribus</u>, in the substitution of more overtime per worker for fewer workers;

(B) for firms working only standard hours, a fall in standard hours is likely to increase employment because the working-time reduction is binding.

Results from profit-maximizing models tend to reinforce (A) and weaken (B). Both modifications are due to the fact that, in this framework, hours reductions induce negative scale effects.

As far as overtime working is concerned, these conclusions have proved crucial in empirical investigations of labour market responses to workweek reductions.

EMPIRICAL FINDINGS

This section concentrates only on empirical work that contains, directly or indirectly, results with respect to overtime working. It has a marked U.K. bias, partly reflecting the special interest in overtime in that country. Relatively little mention is made of the role of wage reactions to cuts in working time, although this topic features prominently in much of the work. Good references in this respect are Brunstad and Holm (1984) and van Ginneken (1984). A comprehensive review of the complete literature is provided by Hart (1986).

On the basis of fairly simple total hours equations, it has been inferred from several U.K. models that reductions in standard hours produce increases in average overtime working. For example, Neale and Wilson (1985), using time-series regressions (1948-80) for 40 separate U.K. industries, obtain long-run values of estimated elasticities of standard hours with respect to total hours that average 0.63. In manufacturing, the equivalent average is 0.35, while in services it is 0.79. They regard these results as reflecting "the tendency for the proportion of overtime hours to increase as negotiated hours have fallen." Using cross-sectional data on the U.K. metalworking industry, Hart and

Wilson (1986) obtain comparable elasticities of between 0.75 and 0.88 for the years 1978-82. Further, Allen (1980) reports that "empirical analysis within the Treasury suggests that actual hours worked in manufacturing (adjusted for cyclical movements in the economy) have tended to fall by between one-half and two-thirds of the reduction in standard hours." He goes on to state that the "implication ... is that for manual workers about 45% of the potential loss in output following a cut in hours will be made up by additional overtime ... (and moreover) ... for all workers in the non-governmental sector the assumed offset is 40%.

Two recent micro-orientated U.K. studies provide strong direct support of the above inferences. In their work on the U.K. metalworking industry, Hart and Wilson (1986) estimate demand equations for employment, average total, and average overtime hours based on cross-sectional random samples of 53 enterprises in the industry. They are able to split their sample between enterprises that work some overtime and those that work only standard hours. Their work indicates that the former enterprises reduce employment and increase overtime as a reaction to reductions in standard hours while the latter increase employment. When the two types of enterprise are aggregated together, effects of reductions in the standard hours on employment are insignificant. This is strongly in accord with the underlying theory.

The other micro-oriented U.K. analysis is based on two large and very detailed establishment-level questionnaire-type surveys on shorter weekly hours in 218 establishments in the U.K. engineering, pharmaceutical, printing, and construction industries which experienced a one-hour cut in the standard workweek in 1981 (see White, 1983, and White and Ghobadian, 1984). Clear evidence is found that the reduction in weekly standard hours either left employment more or less unchanged or resulted in lower employment. Further, average overtime hours increased. It should be added that the study

period covered a time of general output stability/slight growth in the industries in question.

For the UK, at least, there is now strong evidence from these and other studies that increased overtime forms a part of the total labour market reaction to standard workweek reactions.

There is little similar evidence elsewhere in Europe because most studies do not separate the two main hours components. One exception to this is provided by a cross-section/time-series model estimated for FRG manufacturing industries from 1969 to 1981 (Hart, 1986). Here the long-run standard hours elasticity with respect to average hours was found to be in excess of unity (1.21), indicating that overtime may reduce more than proportionately to standard hours. This is clearly not in line with the standard theory, but it is compatible with models that contain wage schedules in which overtime pay is a continuously rising function of average total hours and a declining function of standard hours (Santamaki, 1983).

In a wider European context, macroeconometric models have provided the leading device for studying empirically the relationship between hours of work and employment. Van Ginneken (1984) summarizes the results of seven models (two French, two for the Netherlands, and one each for FRG, Belgium, and the U.K.). Whitley and Wilson (1985) have added another U.K. study, while other reviews are provided by Franz (1984), Gorres (1981 and 1984), and Hart (1986).

The study by van Ginneken is particularly useful since it attempts to standardize the results from the models by estimating the employment elasticity based on a 1% reduction in the length of the workweek. These elasticities are calculated under two alternative hypotheses: there is no compensation for the reduction in hours; and there is full wage compensation.

From a policy perspective, the results appear at first sight to be rather encouraging. In only one model -- one of the two Netherlands studies -- are negative employment elasticities found, and these are obtained only under the assumption of full wage compensation. The elasticities are also based on assumptions concerning capacity reactions to hours cuts and are in the range -0.08 to -0.19. At the other end of the spectrum, elasticities in the region of 0.6 to 0.8 are found in the two French models and the FRG model. The U.K. model of Whitley and Wilson (1985) produces, under the authors preferred specification, an employment elasticity of 0.37, while the other U.K. (Treasury) model provides relatively low elasticities of between 0.05 and 0.28.

Both of van Ginneken and Whitley and Wilson provide strong reasons why models with relatively low employment elasticities should be taken considerably more seriously than other models. Included among these reasons is the fact that the former models allow for overtime offsets in their simulations. This is true, for example, of the two U.K. studies.

In the case of the FRG model (see Heinze 1980 and 1981), there is an estimate of between 80,000 and 1,120,000 new jobs created in FRG, given a 2-hour reduction in the workweek. These figures are almost certainly due to crude estimating assumptions, particularly with respect to a simplistic investment accelerator formulation. By contrast, Franz (1984) reports on estimates obtained by the IFO-Institute (1983) into the likely reaction of firms to the same 2-hour reduction, assuming constant nominal incomes. The results are presented for production and administration and are based on a sample of 2,900 firms employing 24% of all employees in these two sectors. The largest response came under the category, "additional measures at rationalization," which over 80% of firms in both sectors indicated would take place. The next highest category was "reorganization of shift work"

with a 47% response in the production sector and a 28% in the administrative sectors. Then came "more overtime" with 9% and 14%, respectively. As far as hiring full-time employees was concerned, only 8% of the production sector and 5% of the administration sector indicated such a response. Franz concludes:

> In the absence of a tremendous bias, these figures confirm ... that a reduction in working hours at unchanged take-home pay will result in a minor expansion of employment, if any at all. (Franz, 1984, p. 645)

Interestingly, van Ginneken presents a very similar contrast between the results of one of the French macro-models and a more direct investigation into an actual standard workweek reduction that took place in January, 1982. The latter (see Marchand et al., 1983) estimated that between 10,000 and 20,000 new jobs would be created in industry and between 4,000 and 8,000 (mainly part-time) jobs in commerce. This contrasted with an estimate of the macroeconometric model of 143,000 new jobs resulting from the same measures.

OVERTIME AND COLLECTIVE BARGAINING

With a few exceptional cases, the overwhelming "official" national-level union attitude in Europe is in favour of significant workweek cuts without proportionate losses of per-period wage earnings (see European Trade Union Institute, 1978). At its Munich Congress in 1979, the European Trade Union Confederation (ETUC) called for a 10% reduction in working time without loss of pay, and this resolution was subsequently reaffirmed at the Hague Congress in 1982. The ETUC's stated objectives have been followed up by several European union organizations in the form of actual demands for hours reductions. The most vigorous of these was undertaken in FRG by the leading union, IG METALL, and resulted in a highly costly strike in the German metalworking industries in 1984. The dispute resulted in a 1.5-hours

reduction in the standard workweek, somewhat short of the 5 hours initially demanded.

The established union position also is firmly against significant levels of overtime being worked. At the Munich Congress, delegates called for both a restriction on existing overtime as well as compensatory time-off when overtime is worked.

It is not clear, however, if national-level union attitudes to overtime are shared by individual unions or by rank and file union members and other workers. Detailed reports from the U.K. (National Board for Prices and Incomes, 1970), Finland (Grohn, 1979) and Ireland (University College, Galway, 1980) indicate very little desire for significant cuts in hours -- overtime or standard -- especially if this results in a loss of average earnings.

The Irish report -- covering in great detail significant parts of the production and service sectors -- is particularly illuminating with respect to these opinions. Along with most of its fellow European national-level union organizations, the Irish Congress of Trade Unions (ICTU) is quoted as stating that:

> ...legislative measures and action by trade unions and employers should eliminate the working of excessive overtime as a regular feature of employment. (p. 57)

When management was asked for its perception of union attitudes towards overtime, the study found that:

> ...the vast majority of firms reported the trade union attitude to be one of acceptance or indifference. However, within the production sector, 14.1% of firms reported the attitude to be one of encouragement. Less than 3% of firms perceived the trade union attitude as one of opposition. (P. 97)

As for the attitudes of individual worker's, the report goes on:

> ... the majority of firms report employees eager or willing to work overtime with only 10% in the service sector reporting employees reluctant to work overtime, and almost 8% in the production sector reporting employees reluctant to work overtime or opposed to overtime working. (p. 97)

It is reported further that 60% of firms in the production sector and almost 50% in the service sector stated that the conditions under which overtime is worked were laid down in labour/management agreements. Moreover, it was found that firms with no trade union membership were less likely to have overtime. For all occupation groups in the production and service sectors, there exists a statistically significant relationship between the practice of overtime and the level of trade union membership.

On the employers' side, the dominant claim throughout Europe is that overtime is employed for sound economic reasons. Again, particularly detailed surveys are undertaken in the above U.K. and Irish studies. Typically, it is argued that overtime provides flexibility in production scheduling, it can help to meet rush orders and unexpected changes in demand, and it serves as a way of circumventing the legislative cost of hiring and dismissing workers. Further, an important use of overtime is to maintain normal production scheduling: this includes making up shortages of skilled workers, meeting employee gaps due to absenteeism and sickness, and setting up activity for production runs during standard working hours.

As mentioned earlier, European governments have been prepared to introduce legislation that imposes minimum premium rates on, or, occasionally, per-period limits to, the amount of overtime working. For example, in Belgium, France,

FRG and Greece there is some limited control of minimum overtime premium payments. Attempts at more direct limits, however, have tended not to prove successful. For example, the Danish government tried to introduce a Bill in 1981 that would have limited overtime working to 100 hours year for any individual employee. In addition to this limit, it would have required that employers grant "time off in lieu" to match any overtime work by their employees. The Bill enabled employers and unions, however, to set aside these conditions if, through collective bargaining agreements, they could arrive at mutually acceptable special arrangements. This proposed measure received particularly strong opposition from employers' associations and it was not enacted.

ASSESSMENT

Most serious economic research in Europe points strongly to the conclusion that attempts to create employment by legislative reductions in the length of the average standard workweek are likely to involve a relatively high cost, combined with low return in the form of employment creation. For many firms, increased overtime and smaller workforces may well provide a reasonable "optimizing" reaction to such reductions. Empirical evidence goes some way towards supporting this view. A particularly costly strategy would be to require firms <u>both</u> to reduce the standard workweek <u>and</u> to limit overtime responses. Capital-labour substitution and other forms of rationalization would become attractive alternatives in this event. There is European evidence that, for relatively small reductions in weekly hours, such responses are indeed feasible and result in job creation.

On the collective bargaining front, there are presently severe obstacles in the way of attempts to effect significant cuts or limitations to overtime working. One acute problem is that national-level union attitudes on these questions may not carry the support of significant elements of their membership. Certainly, there would be strong hostility to

suggestions of systematic reductions in overtime that also involved reductions in average earnings.

It seems to the author that too much of the working time debate in Europe has focussed on once-and-for-all, long-term, structural changes in average hours of work. Too little interest has been shown towards attempts at achieving greater pro-cyclical fluctuations on intensive work margins, as in Japan. Greater flexibility of average weekly hours -- as well as annual and lifetime distributions of working time-may well be the most rewarding general direction to follow. At present, it is primarily overtime working that provides many European firms and workers with the relatively small amount of flexibility within their total per-period working hours.

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